Case 4204
Ovarian endometriosis

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Section: Genital (Female) Imaging
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Patient: 29 year(s), female

Clinical Summary

A 29-year-old female was evaluated for persistent pelvic pain and infertility.

Clinical History and Imaging Procedures

The patient came to our department to undergo an investigation for persistent pelvic pain and infertility. A transabdominal US performed one month earlier revealed a left ovarian hemorrhagic cyst. Her past medical history was unremarkable. Transabdominal and endovaginal US showed bilateral ovarian lesions. There was a right adnexal mass with two components, one 4,2 cm-sized with pure cystic content and another hypoechoic lesion with posterior acoustic enhancement and measuring approximately 2 cm (Fig. 1a). The left adnexal mass was a complex lesion with two larger components sized 9 cm and 7 cm (major axis) respectively and a homogeneous smaller one, sized 1,8 cm (Fig. 1b); all three were hypoechoic. On MRI (Fig. 2a-d) the two larger cysts on the left side showed high-signal intensity and the major right cyst had low-signal intensity on T1-weighted images (Fig. 2a). The two left cysts became low-signal intensity on T2-weighted images (Fig. 2b and Fig. 2c), reflecting "shading" a common and important feature of endometriomas. Additionally, they remained high-signal intensity on T1-weighted fat suppressed images (Fig. 2d) confirming the non-fat content of these lesions. The right cysts were high-signal intensity on T2-weighted images. No pelvic lymph node enlargement was found. CA-125 value was 957.5 U/ml (normal: below 35 U/ml). One month later, a laparotomy was performed. The two cysts on the left ovary were removed and the diagnosis was "endometrial cysts" and the larger cyst of the right ovary was also resected and the diagnosis was "serous cystadenoma".

Discussion

Endometriosis was first described by Rokitansky in 1860 and occurs in up to 10% of women almost exclusively of reproductive age. It is defined as the presence of heterotopic secretory endometrium in ectopic locations. Although the pathogenesis is still under discussion, three theories have emerged: (1) metaplastic transformation of peritoneal epithelium into functional endometrium; (2) peritoneal seeding due to retrograde menstruation; (3) activation of mesenchymal cells differentiation caused by endometrium in the peritoneal cavity from retrograde flow. The most common sites for endometrial implantation in the pelvis are the ovaries, broad and round ligaments, Fallopian tubes, cervix, vagina and pouch of Douglas. The hallmarks of endometriosis are endometriomas (multiloculated cystic lesions), peritoneal implants (solid endometrial tissue) and adhesions. Repeated cyclic hemorrhage within a deep implant produces ovarian endometrial cysts (endometriomas). Endometriomas are bilateral in up to half of the cases and may be large, although they seldom exceed 15 cm in diameter. The symptoms do not necessarily correlate with disease severity and include pelvic pain, dysmenorrhoea, dyspareunia and infertility in 30-40% of patients. Laboratory tests lack the necessary sensitivity and specificity although CA125 may help to evaluate selected populations at risk, to follow the course of the disease and to monitor response to treatment. It can also rise in conditions like ovarian cancer and inflammatory pelvic disease. Malignant transformation is a rare (<1% of cases), but well-described complication of endometriosis.Two imaging modalities are crucial: US and MRI. Ultrasonography is usually the first to be performed. Endovaginal sonography has some advantages over transabdominal sonography in the assessment of adnexal masses, including better localization of disease processes to the ovary or Fallopian tube and better characterization of the cyst wall, content and the nature of the solid components. Diffuse low-level internal echoes (occurring in 95% of endometriomas) and echogenic wall foci are the more specific US features of endometriomas. Whenever sonography is indeterminate, MRI is the imaging modality of choice: shows high accuracy for both anterior and posterior endometriosis, excludes malignancy and enables complete lesion mapping before surgery. At MRI, typical features of endometriomas are high signal intensity at both T1- and T2-weighted sequences persisting at fat-suppressed T1-weighted images. Fat suppression helps to differentiate endometriomas from cystic teratomas. Gradual variation of signal intensity at T2-weighted images has been described as "shading" and is due to chronic bleeding with accumulation of high concentrations of iron and protein in endometriomas, helping differentiation from functional cysts that do not demonstrate "shading" and disappear at follow-up. Adhesions are identified on MRI when a clear interface cannot be demonstrated between an endometrioma and adjacent organs. However small implants and adhesions are not well evaluated radiologically; therefore laparoscopy remains the standard of reference for diagnosis and staging of the disease.

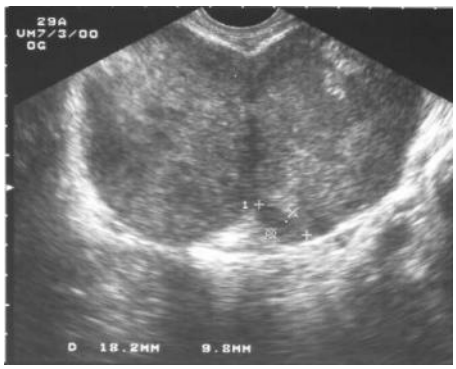
Final Diagnosis

Left ovarian endometrioma

Figures

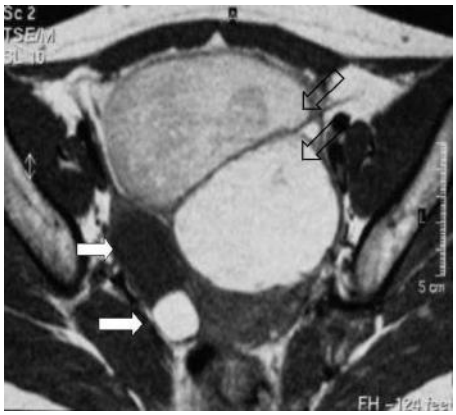
Figure 1 Transvaginal US

Transvaginal US scan of right ovary showing two cysts with posterior enhancement, one anechogenic, sized 4,2 cm X 3 cm and the other with low-level internal echoes sized 25 X 16 mm.

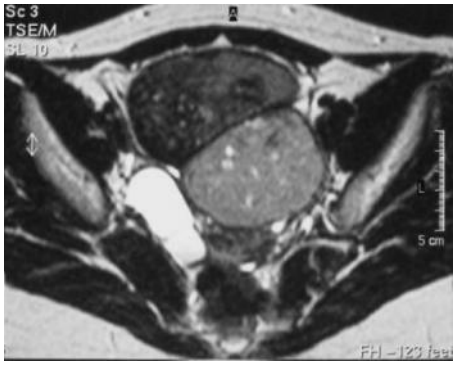


Left ovarian transvaginal US scan showing two large heterogeneous hypoechoic lesions and a hypoechoic and homogeneous smaller one, sized 18 X 10 mm, with no significant posterior enhancement.

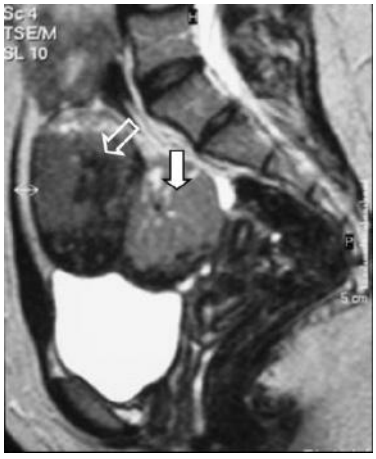
Figure 2 MRI images



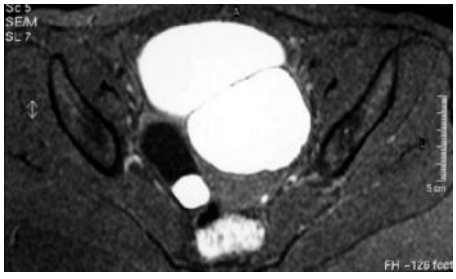
T1-weighted image: two large high-signal intensity cysts in the left adnexal area (open arrows), and in the right adnexal area a small high-signal intensity cyst (long solid arrow) and a larger low-signal intensity cyst (short solid arrow) can be detected.



T2-weighted image showing predominantly low-signal intensity of the two lesions in the left adnexal area, while they were high-signal intensity on T1-weighted images ("shading") and in the right adnexal area, high-signal intensity cysts.



Sagittal T2-weighted image showing, anteriorly to the uterus, the two large cysts of the left adnexal area (arrows) with low-signal intensity.



T1-weighted fat-suppressed image showing that the cysts with high-signal intensity on T1-weighted images remain bright which rules out a diagnosis of bilateral dermoid cyst.

MeSH

Endometriosis [C13.371.163]

A condition in which functional endometrial tissue is present outside the UTERUS. It is often confined to

the PELVIS involving the OVARY, the ligaments, cul-de-sac, and the uterovesical peritoneum.

References

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Citation

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